

# ***808nm Diode Laser***

## **USER MANUAL**

Please read this manual carefully  
before operating this machine.

Keep it for future reference.

### **Important safety information**



#### **Danger**

The following instructions contain important safety information, which may lead to death or critical injury if not followed.



#### **Warning**

Injury may occur when the following instructions are not followed.



#### **Restriction**

Refrain from administering if the person or the **area** to be treated is affected by one of the following condition.



#### **Danger**

The following instructions contain important safety information, which may lead to death or critical injury if not followed.



Be sure to keep the metal pins of the power plug free from dust or moisture. When cleaning, use a cloth-cleaner.



Using multiple products on a single outlet is not recommended.



Keep the unit and the power plug away from heaters or stoves.



Do not pull the power plug by force or with wet hands.



Neither bending the power cord nor placing heavy objects on the power plug is recommended.



The unit is not designed for cleaning with water. Always clean with a dry cloth-cleaner before storing the unit.

**\*Do not operate the product in elevated or wet places.**

**\*Ensure that the unit is turned off when connecting or disconnecting the power plug.**

**\*Do not leave the unit connected to the power when not in use over a long period of time.**

**\*Disconnect from the power supply when cleaning the unit.**



#### Warning

Injury may occur when the following instructions are not followed.



Always keep the hand piece in contact with the skin when the beam is on.



Do not beam direct on to unshielded eyes. Do not use the unit to eyes or eyelids.



The unit is not to be used by children or persons with reduced physical, sensory or mental capabilities ,or lack of **experience** and **knowledge**, unless they have been given instruction.



#### **Restriction**

Refrain from administering if the person or the **area** to be treated is affected by one of the following conditions.



A person whose activity was outdoors under strong sunlight,or who has received tanning treatment within the last 4 weeks.



A person whose skin color is black ,or dark brown should use lower energy and parameters.



Pregnant women or the **breast** during the breast-feeding period.

**Do not use to this area....**



**Skin area with tattoos**



**Skin affected by diabetes or other skin diseases.**

Laser type	Diode laser
Laser wavelength	808 nm
Power	1500W
Density	10.4 inch color touch LCD screen
Spot size	10 * 12 mm <sup>2</sup>
Pulse width	10-1, 400 ms adjustable
Energy	1-120 J/cm <sup>2</sup> adjustable
Frequency	0.5~10Hz
Cooling	Water + air + Semiconductor
Temperature of probe	-2~3C
Working environment:	
Environment temperature	5-40 <sup>0</sup> C
Relative humidity	<=80%
Atmospheric pressure	860hpa-1060hpa
Working Voltage	~220V+-10%, 50HZ
Transportation and store:	
Environment temperature	- 20~60 C
Relative humidity	<=100%
Atmospheric pressure	500hpa-1060hpa
Size	59*64*113 cm
N. Weight	62kg
Voltage	220V (110V)/15A 50Hz (60Hz)
Packing	Aluminum alloy case

### **Features:**

- 3 The only system to provide permanent hair reduction using state-of-the-art, high-power diode technology;
- 4 Adopts 808nm-Golden Standard wavelength which is particularly absorption by the pigmentation in hair follicles without injury to surrounding tissue, thus remove the hair permanently;
- 5 Perfect combination of long pulse duration and sapphire contact cooling promise more power given onto the skin to remove hairs of all skin types without injury of epidermis;
- 6 Well worked contact cooling system provide comfortable, safe and efficient treatment procedure;
- 7 High power system removes hair of any colors and on anywhere;

8 20X12mm<sup>2</sup> is the maximum size for effective usage of the diode laser, thus the given energy could be effectively worked on the treatment, and let the patient enjoy the hair removal procedure just like shaver moves on body

9 The pure imported Diode Laser-Palladium Bar promises to output big power, and stability of the whole machine;

10 Rapid, non-invasive treatment that is and entails virtually no patient downtime;

11 Except the cooling in the handle, we also add special cooler in the water case in the machine, and this water case was wrapped with cotton of constant temperature, thus this machine could permit long time working.

**Application Range:**For fast, safe, painless and permanent hair removal on all 6 skin types, including dark skin. Suitable for any unwanted hairs on areas like face, arms, armpits, chest, back, bikini, legs...



#### Fill cooling water

##### A: Inject water

Twist open the "water inlet" and "air outlet" nut, water goes through the funnel from the "water inlet" hole to join, until the overflow by "water overfull". Tighten the two nuts.

##### B: Off-watering (used in exceptional circumstances)

Draining the "water outlet" and "air outlet" nut, the water will flow from the drainage port.

And then wait for the water shorting, the two holes of the nut tightening.

**NOTE:: Add water, the corresponding position in the “overfull”, there should be a container to place the water. (see diagram**      **WARNING: •ANY TIME, WATER CONDITAIONS ALLOWED THE BOOT!**

**•THE WATER SHOULD BE PURE WATER OR DEIONIZED WATER**

### **Check input Voltage**

Before connecting to the power, please check whether the input voltage of machine accord to power supply voltage (see nameplate) unanimously, to avoid unnecessary risk.

### **Connect power supply cord**

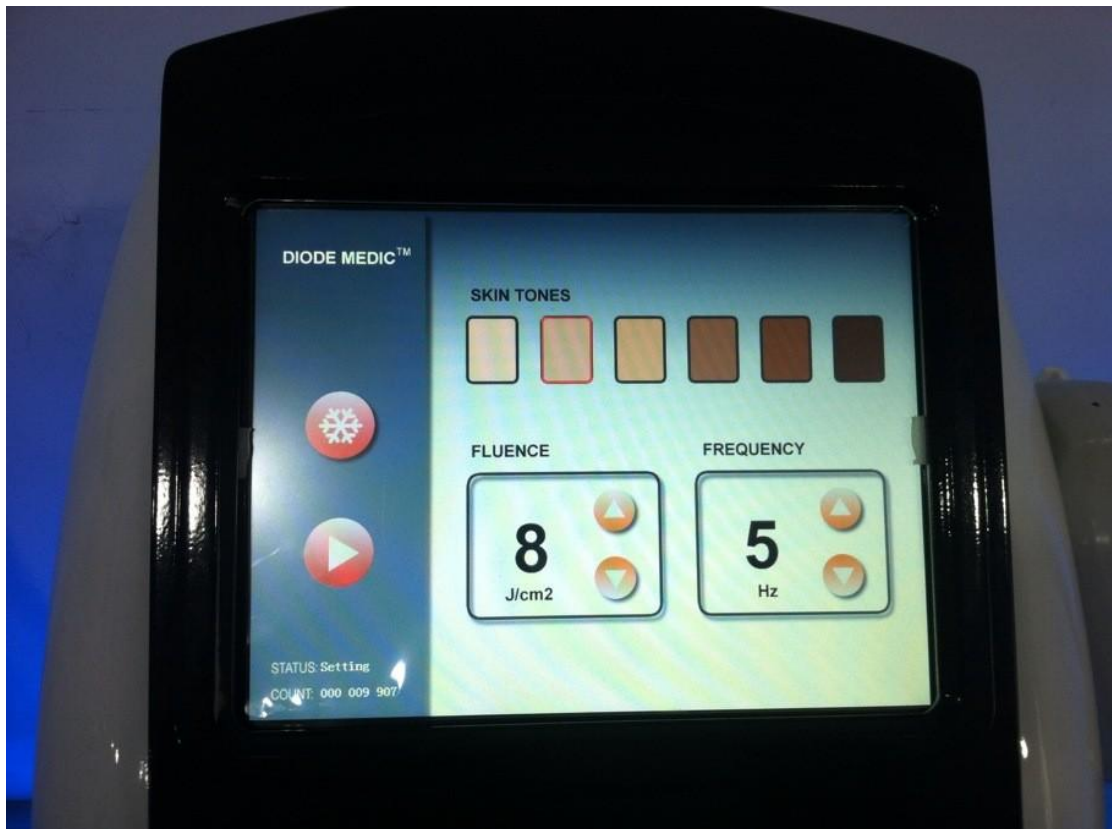
The corresponding one end of the power cord into the machine power outlet, plug the other end of network power supply output. (Note: Net power supply must have a good grounding is recommended grounding of medical grade).

### **Connecting foot switch**

The power cord of the foot switch connect to the corresponding socket, when the hear the "pop and click" sound that indicated that they had a normal connection.



**Salon Diode Laser Hair Removal System**  
**System Initializing ...**



## Attentions

7.1 Direct laser irradiation at any time does not allow people's eyes or the health of the skin.

7.2 In order to prevent the human eye or skin subject to laser radiation, do not allow laser to smooth the surface, so as to avoid the formation of reflection or diffuse reflection of laser, such as: stainless steel surface, mirror and so on.

7.3 Equipment associated components with 75% alcohol cleaned and disinfected, you must complete evaporation of alcohol, etc. only after the use of laser in order to avoid fire or explosion. Using this instrument, we must avoid the use of flammable anesthetics or oxidizing gases such as nitrous oxide (N<sub>2</sub>O) and oxygen.

7.4 Segment position in order to prevent contamination of the focusing lens, but also to ensure a clean surgical environment, the proposed smoking device used in an operation. Segment and focusing lens cleaner at least once every 3 months.

7.5 During operation, within 35m range area, look directly at laser will damage the eyes. Equipment operator must be at work, wearing protective glasses.

7.6 There will be high pressure inside of equipment, Non-professional staff is strictly prohibited to open instrument chasis, so as to avoid an electric shock.

7.7 Once the machines emit abnormal smell or produce an abnormal sound, should

immediately cut off the power, unplug the power cord to inspect, before troubleshooting before the ban electricity.

**Laser tube is made from glass, be careful operation to avoid damage.**

7.8 The temperature range under normal operation 5 °C ~ 30 °C, humidity 10% ~ 80%.

7.9 To prevent the laser tube wall above water to ice Frost Crack, empty the water of tank before removing equipment.

7.10 Equipment parts and components on the end of life, do not arbitrarily discard, please follow the relevant laws and regulations to local environmental protection departments for processing.

7.11 Equipment when not in use to pull out the key to lock switch, and the key kept by specialized personnel.

7.12 The operating room should be equipped with dust or smoke device, to prevent dust pollution emissions from biological tissue.

## **8.Maintenance**

The instrument's power supply and laser tube will produce high-voltage. Please maintenance the instrument by professionals in order to avoid an electric shock.

### **8.1 Lens Cleaning**

After six months, for machine, output energy will be slightly lower, this may be due to Segment focusing lens has been pollution.

With wet cotton balls graze several lenses, be care to avoid lens damage.

### **8.2 Machine chassis cleaning**

If there is dust inside the chassis can be used wet cotton cloth dipped into the detergent or toothpaste to clean. Fabric should not be too wet to prevent equipment short-circuit.

### **8.3 Power calibration**

The laser output power should be calibrated each year. Normal Laser Power Meter Calibration should be used, and personnel should have appropriate qualifications.

## 8.4 Fuse Replacement

Cut off the power, unplug the power cord before proceeding with the replacement fuse. Replacement, screw with a screwdriver under the fuse to install seat, remove the waste fuse, install a new fuse, fuse installed to install and tighten the seat and pay attention to the appropriate fuse size should be consistent with the nameplate.

## DIODE LASER HAIR REMOVAL BEST OEM SOLUTIONS

### ■ WE KNOW LASER DIODES BETTER.

1. We are professional laser diode manufacturer with 5 years experience.
2. We work on high power laser diode chips and laser diode stacks only.
3. We have more experience on micro-channel laser stacks maintenance.

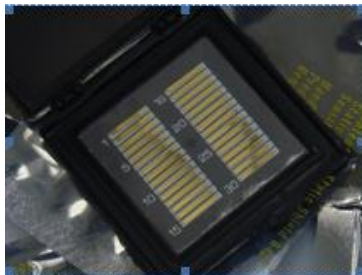
### ■ WE DELIVER QUALIFIED TECHNICAL PARAMETERS.

1. We deliver full pulse energy as requested, even up  $>150\text{J}/\text{cm}^2$  is possible.
2. We always focus on the improvement for skin cooling. Now we can reach  $-5^{\circ}\text{C}\sim+5^{\circ}\text{C}$  for skin cooling.
3. We never stop the technical improvements on diode chips, structure designs, electronics and software.

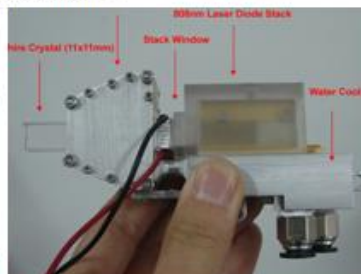
### ■ WE PROVIDE OEM & ODM SOLUTIONS FROM LASER DIODES TO FULL SYSTEM.

1. We provide laser sources from laser diode chips, laser stacks to handle piece.
2. We provide electronic parts from laser diode drivers, control board to LCD software.
3. We provide standard OEM systems and also custom products.

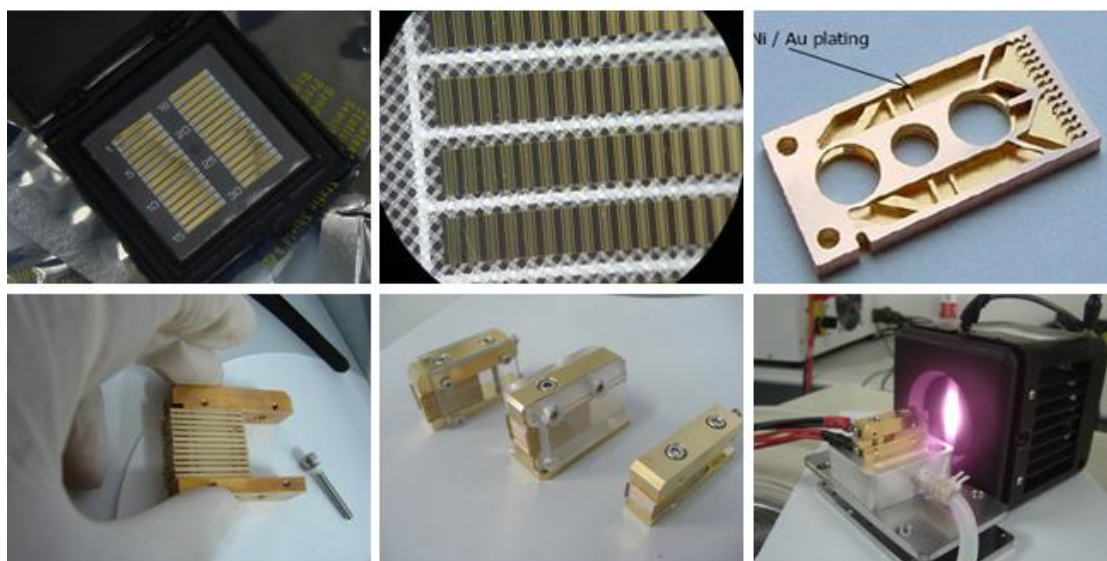
### I) LASER DIODE CHIPS AND LASER STACKS



### II) HAIR REMOVAL HANDLE PIECE ASSEMBLY



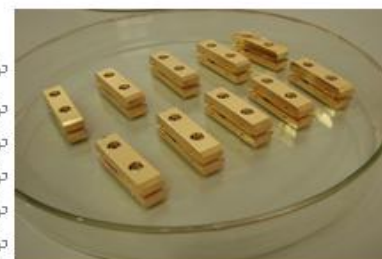
### III) LASER DIODE CHIPS AND LASER STACKS FOR HAIR REMOVAL \*\*\*



Based on **MICRO-CHANNEL COOLER** package, NDL provides high power laser diode bars, arrays and stacks from 780nm, 808nm, 915nm, 940nm, 980nm up to 1060nm. This infrared wavelength is proved to be the best wavelength for hair removal treatments, especially for 808nm/810nm. Most of the hair removal systems are now choosing laser powers from 200W up to 1000W or more, such as 240W for **Aroma**, 600W for **Alma Laser (Soprano)**, 1600W/2900W for **Lumenis (LightSheer)** and etc.

#### 1. Typical Laser Diode Bar Parameters

Laser Bar Type	Units	60W BAR	80W BAR
Center Wavelength $\lambda$	nm	808 / 940	808 / 940
Wavelength Tolerance	Nm	+/-3	+/-3
Output Power	W	60	80
Fast Axis Divergence(FWHM)	degree	35	35
Slow Axis Divergence (FWHM)	degree	8	8
Operating Current	A	$\leq 70$	$\leq 90$
Threshold Current	A	$\leq 18$	$\leq 25$
Operating Voltage	V	$\leq 2$	$\leq 2$
Power Conversion Efficiency	%	~50	~50
Operating Temperature	°C	15~45	15~45
Coolant		Deionized water	Deionized water
Min Flow Rate/Bar Required	L/min	$\geq 0.25$	$\geq 0.25$
Max Inlet Pressure	kPa	380	380



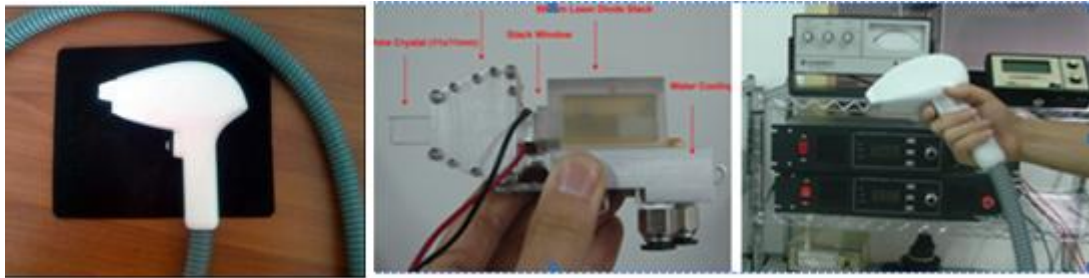
#### 2. Typical laser diode stacks for hair removal

Stack Type	3x60W STACK	6x60W STACK	10x60W STACK	12x60W STACK
Optical Power	180W	360W	600W	720W
Operation Voltage	<6V	<12V	<20V	<24V

#### \*\*\* Notice:

1) This product is for professional equipment manufacturers only. The client must have long experience on laser diodes operation, maintenance, cooling, packaging, protection and etc.

## II) HAIR REMOVAL HANDLE PIECE ASSEMBLY \*\*\*



### Standard Handle Piece Model:

Handle Piece Model	HP
Wavelength	808nm/940
Max Energy(Fluence)	120~150J
Sapphire Window Dimension	16x10mm
Typical Fluence(50ms, 10Hz)	60J/cm2
Typical Fluence(50ms, 15Hz)	90J/cm2
Peltier(TEC)Operation	7.5V 15A
Min Flow Rate Requirement	3.0L/min

## III) POWER SUPPLY, CONTROL, SOFTWARE AND FULL SYSTEM \*\*\*



NDL also provides electronic products for the laser stacks and handle piece, including power supply (laser diode driver), MCU based control board, LCD and software for OEM / ODM clients.

Part Name	Function Description
Laser Diode Driver	1) Provide constant current control for laser pulses with excellent pulse shape. 2) Designed with analog modulation and external control interface. 3) High efficiency without extra cooling. 4) Designed with laser diode protection circuits for safe operation.
MCU Control Board	1) Control laser diode driver, pump, fans and all the other parts of the system. 2) Control peltier cooler to reach <b>-5°C~+5°C for Skin Cooling</b> 2) Communication with LCD screen.
LCD & Software	1) Provide simple & easy user control interface with touch-screen.

### Basic Notice:

- 1) These products are designed for OEM manufacturers or distributors for easy system integration.
- 2) Most of these spare parts are 3C qualified.

### Treatment Notice

- 1) The treatment of the hair removal needs experienced professionals. Do not use it if you have no experience for such kind of laser device.
- 2) Operators and patients must wear laser goggles to protect eyes from any laser damage threat.
- 3) Please notice that this is a high power laser device and if the patients feel very painful, please stop the laser and check if there is anything happens to the patients' skin. Adjust it as a proper power that the patients can stand to do the treatment.
- 4) Skin color is very important. For white to light color, you can adjust the laser power up to 80~100% for a higher performance, and the Fluence can be adjusted to 40~90J/cm<sup>2</sup>. For light color to light brown, you need a lower laser power (30%~60% for example), with a longer pulse width to protect any skin burning. Also you need to extend the treatment time for the dark skin to inject enough energy to the skin and follicles.
- 5) The skin must be shaved before treatment.
- 6) The handle piece is better to be operated at **SCANNING** mode. It is faster for treatment.
- 7) Skin contact gel is not necessary for treatment. It won't make the treatment better or improve the skin feeling.
- 8) You need to wait for several minutes before the cooling tip becomes cold.
- 9) Keep contact between the cooling tip and skin. And you can also use the edge of the Aluminum head of the handle piece to cool down the skin during treatment.
- 10) Never shot the laser pulses to eyes, or watch the laser directly.
- 11) Please refer to the experience data of Color II Skin hair removal which we provide along with this manual.

### Warranty Notice

Please take necessary protections for the operation of the machine and handle piece, and notice that following situations can not be warranted:

- 1) Operation the system without water.
- 2) Power up the system without connecting the handle piece.
- 3) Regular drops of the handle piece.
- 4) Wrong input VAC.
- 5) Other manual operating mistakes.

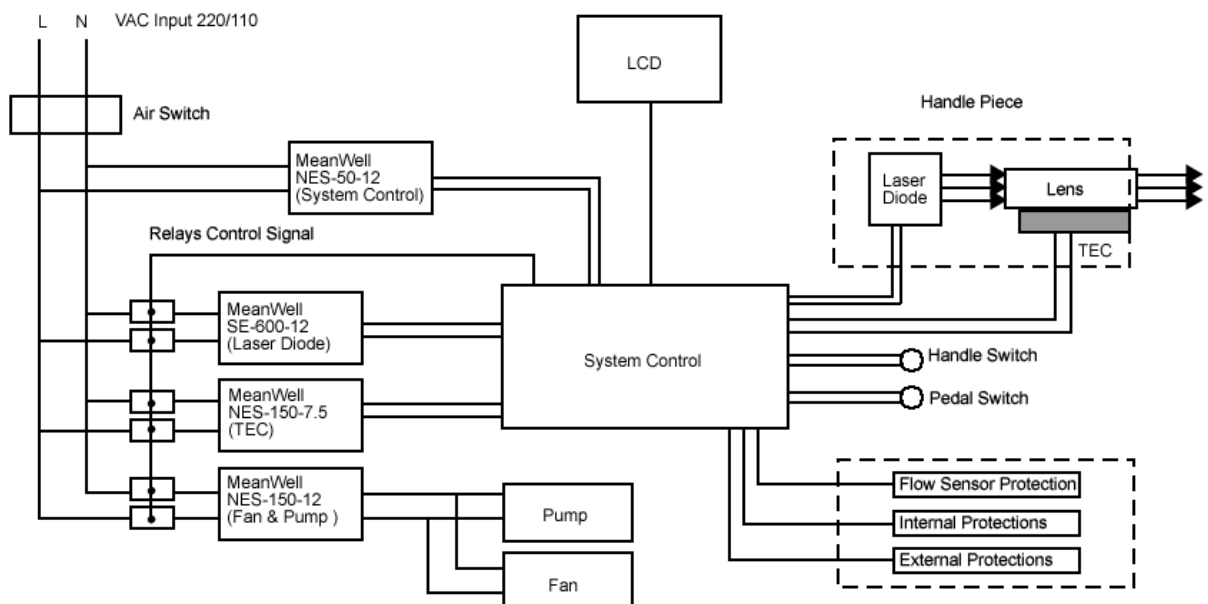
**Status: Error 01~12.** This means the system protections take action. You need to check if anything goes wrong with the system or environment. The error code is as follows:

Error#	Protection	Possible Reasons
Error 01	N/A	
Error 02	Emergency Button	Somebody pressed down the emergency button.
Error 03	N/A	
Error 04	Room Temperature Low	The room temperature is <5°C. This may cause icing.
Error 05	Water Temperature High	Water temperature >35°C. Please check if the room temperature is >28°C. The room must be with air conditioner. Or it may cause cooling problem for the laser. If this ERROR happens, you need to move it to a room

		<28°C. Re-start the machine and press ready and do not shoot the laser. The system fan and pump will work for 10 minutes to cool down the water. After the water is cooled down, the ERROR should disappear.
Error 06	Water Level Alarm	The water tank is not fully filled.
Error 07	PCB Temperature High	PCB is too high.
Error 08	Flow Rate Protection	The water flow for the handle piece is not enough. Check if you bend the tube too much, or the water connection of the handle piece is not well-done. Or there is not enough water in the water tank.
Error 09	Handle Piece Problem	Please contact us to check the handle piece.
Error 10	Over Current Protection	Over current protection for the laser diode. Please check if your wall-plug and VAC voltage is in good conditions. Or contact us for solutions.
Error 11	Laser Diode Temperature	Laser diode temperature is too high.
Error 12	N/A	

### System Electrical Schema V2.1

Date 2012-05-01



## ● Malfunction and solutions

### 1.No power supply:

a.Check up whether there is power sup

- b. Check up whether the power line is connected well.
- c. Check up the fuse, which could be pulled out at the bottom of hole for power plug.
- d. Check up if you open the key switch and emergency switch.

**Solution:**

- a. connect well the power line
- b. change the fuse;
- c. open the key switch and release the emergency switch button

**2.Non-Refrigeration after opening the machine:**

- a. cooling electric source is broken
- b. Semiconductor is broken
- c. there's air in the treatment head, non well water circulation

**Solution:** Contact us directly

**3.Treatment Head leakage:**

- a. the screws of the head loose
- b. the water pipe inner of the head has dropped down
- c. lamp or crystal of the head is broken

**Solution:** Contact us directly

**4.The Treatment head can't light on:**

- a. The head is broken
- b. The controller is broken
- c. The Power line is broken

**Solution:** Contact us directly

**5.No Flashing:**

- a. Do not control well of the switch on the treatment head
- b. Make the wrong operation
- c. The controller is broken
- d. The power line is broken
- e. Need to change a new treatment head.

**Solution:** Contact us directly